UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/784,989	02/25/2004	Tomoo Takahara	826.1925	8955

21171 7590 11/13/2006

STAAS & HALSEY LLP
SUITE 700
1201 NEW YORK AVENUE, N.W.
WASHINGTON, DC 20005

EXAMINER	
LE, THI Q	
ART UNIT	**PAPER NUMBER**
2613	

DATE MAILED: 11/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/784,989	TAKAHARA ET AL.
	Examiner	Art Unit
	Thi Q. Le	2613

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 25 February 2004 and 11 May 2004.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-27 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-17,19-23 and 25-27 is/are rejected.

7)☐ Claim(s) 18 and 24 is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 25 February 2004 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date 5/11/2004.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d).

Information Disclosure Statement

2. The information disclosure statement (IDS) filed on 5/11/2004 was considered by the examiner.

Claim Objections

3. Claim 24 is objected to because of the following informalities:

a) On **line 3** of **claim 24**, replace "deterniming" with --determining-- after "in said". Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. **Claims 1 and 3-4** are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claims 1, 3 and 4 recited the data flip-flop is setting a decision phase and a decision threshold. While, nowhere in the specification, was any disclosure of a data flip-flop being able to set a decision phase and a decision threshold. Further, it clearly states in the specification that "The DFF 11 performs the decision process of the monitor signal from the demultiplexer 10', based on a decision threshold Vth1 set by the decision threshold setting circuit 12 and a decision phase T1 synchronous with a clock signal transmitted from the clock recovery circuit 7 through the delay circuit 13, and outputs a logical value indicating the result to the integration circuit 14."

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. **Claims 18 and 24** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claims are generally narrative and indefinite, failing to conform with current U.S. practice. They appear to be a literal translation into English from a foreign document and are replete with grammatical and idiomatic errors.

8. **Claims 14, 15 and 27** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

9. **Claim 15** recites the limitation "**the variable chromatic dispersion compensator**" and "**transmission quality information**" in **lines 5-7**. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

11. **Claims 1 and 2** are rejected under 35 U.S.C. 102(e) as being anticipated by **Wiesmann et al. (US Patent # 6,968,134).**

Consider **claim 1**, Wiesmann et al. clearly disclose, a dispersion monitoring device for monitoring a dispersion characteristic of an optical communication system (abstract), comprising: a data flip-flop (read as, flip flops of stages 21 and 2n; figure 10) determining whether an input signal is at a high level or a low level by inputting a received signal obtained by optically/electrically converting optical signal transmitted through the optical communication system, and outputting the result of decision as a logical value; an integration circuit (read as, integrators 81 to 8n; figure 10) averaging logical values outputted from the data flip-flop; and a dispersion detection unit (note; the unit as a whole act as a dispersion detection unit because it takes samples of the input signal and generate a distribution curve and based on the curve the dispersion can be measured) detecting a change in dispersion caused in the optical communication system (abstract; figures 1; 4 and 10; column 7 lines 1-30).

Consider **claim 2, and as applied to claim 1 above**, Wiesmann et al. further disclose, a plurality of the data flip-flops (read as, sampling stages 21 to 2n using flip flops; figure 10) at least one of the decision phase and decision threshold of which is set differently from each other

(read as, each sampling stage has different threshold value; column 7 lines 1-17); and a plurality of integration circuits (read as, integrator 81 to 8n) corresponding to the plurality of data flip-flops, wherein said dispersion detection unit detects a change in dispersion caused in the optical communication system, based on the level of a signal outputted from each integration circuit (note, after measurement enough data, the apparatus calculates a distribution density function using that data, which correspond to the dispersion values in the optical transmission system) (figure 4 and 10; column 7 lines 1-17 and 25-30).

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

13. The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

14. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any

evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

15. **Claims 1, 3-10 and 15** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Wilson et al. (US Patent # 6,798,500)** in view of **Sobiski et al. (US Patent # 6,498,886)**.

Consider **claim 1**, Wilson et al. show and disclose, a dispersion monitoring device (read as, chromatic dispersion monitor; abstract) for monitoring a dispersion characteristic of an optical communication system, comprising: a data flip-flop (read as, latching decision devices 206, 208; figure 8) determining whether an input signal is at a high level or a low level (read as, comparing a measured amplitude value with a reference threshold and generating a bit value; column 3 lines 23-30) by inputting a received signal obtained by optically/electrically converting optical signal transmitted through the optical communication system and setting a decision phase and a decision threshold (read as, the time is adjustable and the threshold is adjustable; column 5 lines 1-8), and outputting the result of decision as a logical value (read as, bit value) (title; abstract; figure 8; column 4 lines 65-67; column 5 lines 1-8). Wilson et al. fail to disclose an integration circuit; and a dispersion detection unit.

In related art, Sobiski et al. disclose an integration circuit averaging logical values outputted from the data flip-flop (read as, a detector 105 receiving a first and second dispersion measurements and calculating a gradient of dispersion between the first and second dispersion measurements; figure 1 and 2); and a dispersion detection unit (note, the detector 105, is also performing the steps of tracking the gradient value; figure 1 and 2) detecting a change in

dispersion caused in the optical communication system (abstract; figure 1 and 2; column 2 lines 60-67; column 3 lines 47-67; column 4 lines 1-22).

It would have been obvious for a person of ordinary skill in the art at the time of the invention to incorporate the teachings of Sobiski et al. with Wilson et al. The gradient of the dispersion, and not its magnitude, is used to determine the appropriate controller command. As such, if the gradient of the dispersion is zero, even though the magnitude of the dispersion is non-zero, no further compensatory dispersion is introduced into the optical communication system. This is one clear advantage of the present invention compared to the conventional methods to effect dispersion compensation.

Consider **claim 3, and as applied to claim 1 above**, Wilson et al. as modified by Sobiski et al. further disclose, a threshold control unit changing and controlling a decision threshold (note, the threshold in which the decision device 208 uses is adjustable; Wilson et al., column 5 lines 1-10), wherein said dispersion detection unit detects a change in dispersion caused in the optical communication system, based on the level of a signal outputted from each integration circuit (read as, sending a command to a dispersion compensator based on the value of the gradient; Sobiski et al., column 2 lines 60-67).

Consider **claim 4, and as applied to claim 1 above**, Wilson et al. as modified by Sobiski et al. further disclose, a phase control unit changing (note, the time in which the decision device 208 uses is adjustable; Wilson et al., column 5 lines 1-10) and controlling a decision phase, wherein said dispersion detection unit detects a change in dispersion caused in the optical communication system, based on the level of a signal outputted from each integration circuit in correspondence with each different decision phase (note; Wilson et al. disclose that

measurements of dispersion are taken at different phase, based the time delay/adjusting apparatus) (read as, sending a command to a dispersion compensator based on the value of the gradient; Sobiski et al., column 2 lines 60-67).

Consider **claims 5 and 6, and as applied to claim 1 above**, Wilson et al. as modified by Sobiski et al. further disclose, wherein said dispersion detection unit detects a change in chromatic dispersion and polarization dispersion caused in the optical communication system (figure 5; column 4 lines 23-42; column 10 lines 23-67).

Consider **claim 7**, Wilson et al. show and disclose, a dispersion monitoring method for monitoring a dispersion characteristic of an optical communication system, comprising: performing a decision process of a received waveform of optical signal transmitted through the optical communication system, using a data flip-flop determining whether an input signal is at a high level or a low level by inputting a received signal obtained by optically/electrically converting optical signal transmitted through the optical communication system (read as, comparing a measured amplitude value with a reference threshold and generating a bit value; column 3 lines 23-30). Wilson et al. fail to disclose averaging logical values outputted from the data flip-flop; and detecting a change in dispersion caused in the optical communication system.

In related art, Sobiski et al. disclose, averaging logical values outputted from the data flip-flop by an integration circuit; and detecting a change in dispersion caused in the optical communication system, based on a change in a level of a signal outputted from the integration circuit (read as, receiving a first measurement of dispersion at a first step; receiving a second measurement of dispersion at a second step; calculating a gradient of dispersion between the first measurement of dispersion and the second measurement of dispersion; column 2 lines 60-65).

It would have been obvious for a person of ordinary skill in the art at the time of the invention to incorporate the teachings of Sobiski et al. with Wilson et al. The gradient of the dispersion, and not its magnitude, is used to determine the appropriate controller command. As such, if the gradient of the dispersion is zero, even though the magnitude of the dispersion is non-zero, no further compensatory dispersion is introduced into the optical communication system. This is one clear advantage of the present invention compared to the conventional methods to effect dispersion compensation.

Consider **claims 8 and 9, and as applied to claim 7 above,** Wilson et al. as modified by Sobiski et al. further disclose, wherein said decision process using said data flip-flop is performed for a plurality of different decision thresholds and decision phases (column 3 lines 30-38).

Consider **claim 10, and as applied to claim 1 above,** Wilson et al. as modified by Sobiski et al. further disclose, an automatic dispersion compensating system comprising: a variable dispersion compensator (read as, adjustable compensator 102; Sobiski et al., figure 1) disposed in a transmission line; and a control circuit (read as, controller 107; Sobiski et al., figure 1) automatically compensating for dispersion caused in optical signal transmitted through the transmission line, by feedback-controlling an amount of compensation in the variable dispersion compensator so as to reduce the change, based on a change in dispersion detected by the dispersion monitoring device disposed on a receiving side before (note, looking on figure 1 from right to left, it is clearly the dispersion monitoring device (read as, detector 105) is placed before the variable dispersion compensator (read as, adjustable compensator 102)) the variable dispersion compensator (figure 1; column 3 lines 39-65).

Consider **claim 15, and as applied to claim 10 above**, Wilson et al. as modified by Sobiski et al. further disclose, wherein said control circuit executes a setting operation so that an initial value of a amount of dispersion compensation of the variable chromatic dispersion compensator can be located in a feedback-controllable range, using transmission quality information (read as, dispersion measurement) (figure 3, step 1-2; column 5 lines 23-56).

16. **Claim 2** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Wilson et al. (US Patent # 6,798,500)** in view of **Sobiski et al. (US Patent # 6,498,886)** and in further view of **Wiesmann et al. (US Patent # 6,968,134)**.

Consider **claim 2, and as applied to claim 1 above**, Wilson et al. as modified by Sobiski et al. disclose the invention as described above; except for, a plurality of the data flip-flops at least one of the decision phase and decision threshold of which is set differently from each other; and a plurality of integration circuits corresponding to the plurality of data flip-flops, wherein said dispersion detection unit detects a change in dispersion caused in the optical communication system, based on the level of a signal outputted from each integration circuit..

In related art, Wiesmann et al. disclose, a plurality of the data flip-flops (read as, sampling stages 21 to 2n using flip flops; figure 10) at least one of the decision phase and decision threshold of which is set differently from each other (read as, each sampling stage has different threshold value; column 7 lines 1-17); and a plurality of integration circuits (read as, integrator 81 to 8n) corresponding to the plurality of data flip-flops, wherein said dispersion detection unit detects a change in dispersion caused in the optical communication system, based on the level of a signal outputted from each integration circuit (note, after measurement enough data, the apparatus calculates a distribution density function using that data, which correspond to

the dispersion values in the optical transmission system) (figure 4 and 10; column 7 lines 1-17 and 25-30).

It would have been obvious for a person of ordinary skill in the art at the time of the invention to incorporate the teachings of Wiesmann et al. with Wilson et al. as modified by Sobiski et al. Since have a plurality of flip flops and integrator with each comparing input signal with different thresholds will reduce the processing time for determining an accurate dispersion value in an optical transmission system.

17. **Claims 11-13** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Wilson et al. (US Patent # 6,798,500)** in view of **Sobiski et al. (US Patent # 6,498,886)** and in further view of **Ooi et al. (US PGPub 2002/0015207)**.

Consider **claim 11-13, and as applied to claim 10 above**, Wilson et al. as modified by Sobiski et al. disclose the invention as described above; except for, wherein said variable dispersion compensator is disposed at a receiving end of the transmission line; at a transmitting end of the transmission line; and within a repeater span of the transmission line.

In related art, Ooi et al. disclose a system for chromatic dispersion compensating. Wherein said variable dispersion compensator (read as, dispersion compensators 16, 36 and 26; figure 2) is disposed at a receiving end of the transmission line; at a transmitting end of the transmission line; and within a repeater span of the transmission line (figure 2; paragraph 0051).

It would have been obvious for a person of ordinary skill in the art at the time of the invention to incorporate the teachings of Ooi et al. with Wilson et al. as modified by Sobiski et al. Since the transmission distances between nodes are always the same, the dispersion

compensation device can be place at different locations throughout the network to satisfy the needs for successful transmission.

18. **Claim 14** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Wilson et al. (US Patent # 6,798,500)** in view of **Sobiski et al. (US Patent # 6,498,886)** and in further view of **Jones et al. (US PGPub2003/0039013)**.

Consider **claim 14, and as applied to claim 10 above**, Wilson et al. as modified by Sobiski et al. disclose the invention as described above; except for, wherein when a wavelength-division multiplexing optical signal including a plurality of waves of channel light each with a different wavelength is transmitted through the transmission line, said dispersion monitoring device is provided in correspondence with channel light with each wavelength of the wavelength-division multiplexing optical signal.

In related art, Jones et al. disclosed a wavelength-division multiplexing optical signal (read as, optical signal coming form optical fiber 20; figure 1) including a plurality of waves of channel light each with a different wavelength is transmitted through the transmission line, said dispersion monitoring device (read as, dispersion compensation system 50; figure 1) is provided in correspondence with channel light with each wavelength of the wavelength-division multiplexing optical signal (figure 1; paragraphs 0027-0029).

It would have been obvious for a person of ordinary skill in the art at the time of the invention to incorporate the teachings of Jones et al. with Wilson et al. as modified by Sobiski et al. Because, using WDM more data can be transferred using the same optical fiber; thus, it is necessary to have dispersion compensation for each wavelength in optical WDM network.

19. **Claims 16-17 and 22-23** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Ihara et al. (US Patent # 5,999,289)** in view of **Sobiski et al. (US Patent # 6,498,886)**.

Consider **claim 16**, Ihara et al. clearly disclose, a chromatic dispersion compensation controlling system for compensating for chromatic dispersion caused when an optical signal is transmitted through a transmission line, comprising: a peak detection unit detecting a peak value of a receiving signal (read as, peak detection unit 34; figure 6) (figures 5 and 6; column 1 lines 45-53; column 6 lines 1-15). Ihara et al. fail to disclose a control unit determining whether chromatic dispersion caused in an optical signal is excessive in a positive direction or in a negative direction.

In related art, Sobiski et al. disclose a control unit (read as, controller 107; figure 1) determining whether chromatic dispersion caused in an optical signal is excessive in a positive direction or in a negative direction, by comparing the peak value with a predetermined threshold and supplying a variable chromatic dispersion compensator with a control signal (read as, calculating a gradient value and control dispersion compensator based on whether the gradient value is greater than zero or less than zero) (figure 1; column 2 lines 55-67; column 3 lines 39-65; column 4 lines 23-67).

It would have been obvious for a person of ordinary skill in the art at the time of the invention to incorporate the teachings of Ihara et al. with Sobiski et al. The gradient of the dispersion, and not its magnitude, is used to determine the appropriate controller command. As such, if the gradient of the dispersion is zero, even though the magnitude of the dispersion is non-zero, no further compensatory dispersion is introduced into the optical communication

system. This is one clear advantage of the present invention compared to the conventional methods to effect dispersion compensation.

Consider **claim 17, and as applied to claim 16 above**, Ihara et al. as modified by Sobiski et al. further disclose, a transmission quality detection unit (read as, detector 105; figure 1) detecting transmission quality information of a receiving signal (read as, measuring the dispersion from received signal), wherein said control unit supplies the variable chromatic dispersion compensator with a control signal, using a positive/negative sign of excessive chromatic dispersion obtained by detecting a peak value and an absolute value of an amount of chromatic dispersion to be compensated that is obtained from the transmission quality information (read as, calculating a gradient value and control dispersion compensator based on whether the gradient value is greater than zero or less than zero) (Sobiski et al.; figure 1; column 2 lines 55-67; column 3 lines 39-65; column 4 lines 23-67).

Consider **claim 22**, Ihara et al. clearly disclose, a chromatic dispersion compensation controlling method for compensating for chromatic dispersion caused when an optical signal is transmitted through a transmission line, comprising: detecting a peak value of a receiving signal (read as, the peak detection unit 34, detects the peaks of the signal; column 6 lines 1-15) (figures 5 and 6; column 6 lines 1-15). Ihara et al. fail to disclose, determining whether chromatic dispersion caused in an optical signal is excessive in a positive direction or in a negative direction, by comparing the peak value with a predetermined threshold and supplying a variable chromatic dispersion compensator with a control signal.

In related art, Sobiski et al. disclose determining whether chromatic dispersion caused in an optical signal is excessive in a positive direction or in a negative direction, by comparing the

peak value with a predetermined threshold and supplying a variable chromatic dispersion compensator with a control signal (read as, calculating a gradient value and control dispersion compensator based on whether the gradient value is greater than zero or less than zero) (figure 1; column 2 lines 55-67; column 3 lines 39-65; column 4 lines 23-67).

It would have been obvious for a person of ordinary skill in the art at the time of the invention to incorporate the teachings of Ihara et al. with Sobiski et al. The gradient of the dispersion, and not its magnitude, is used to determine the appropriate controller command. As such, if the gradient of the dispersion is zero, even though the magnitude of the dispersion is non-zero, no further compensatory dispersion is introduced into the optical communication system. This is one clear advantage of the present invention compared to the conventional methods to effect dispersion compensation.

Consider **claim 23, and as applied to claim 22 above**, Ihara et al. as modified by Sobiski et al. further disclose, wherein in said determining step, a control signal is supplied to said variable chromatic dispersion compensator, using a positive/negative sign of excessive chromatic dispersion obtained by a detection of a peak value and an absolute value of an amount of chromatic dispersion compensation to be compensated that is obtained from the transmission quality information (read as, calculating a gradient value and control dispersion compensator based on whether the gradient value is greater than zero or less than zero) (Sobiski et al.; figure 1; column 2 lines 55-67; column 3 lines 39-65; column 4 lines 23-67).

20. **Claims 19-20 and 25-26** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Ihara et al. (US Patent # 5,999,289)** in view of **Sobiski et al. (US Patent # 6,498,886**) and in further view of **Jones et al. (US PGPub 2003/0039013).**

Consider **claims 19 and 20, and as applied to claim 17 above**, Ihara et al. as modified by Sobiski et al. disclosed the invention as described above; except for, wherein said transmission quality detection unit detects an error rate of a receiving signal using an FEC function; and wherein said transmission quality detection unit detects an error rate of a received signal using a byte B1 of an overhead if the received signal is a SONET/SDH signal.

In related art, Jones et al. disclose wherein said transmission quality detection unit detects an error rate of a receiving signal using an FEC function; and wherein said transmission quality detection unit detects an error rate of a received signal using a byte B1 of an overhead if the received signal is a SONET/SDH signal (read as, the bit error rate 46 is determined at the receiver, for example by known techniques such as examination of SONET overhead bytes, or through forward error correction statistic (FEC)) (figure 5; paragraph 0047).

It would have been obvious for a person of ordinary skill in the art at the time of the invention to incorporate the teachings of Jones et al. with Ihara et al. as modified by Sobiski et al. Because Jones et al. disclosed a system and method for improving the accuracy of dispersion compensation.

Consider **claims 25 and 26, and as applied to claim 23 above**, Ihara et al. as modified by Sobiski et al. disclosed the invention as described above; except for, wherein an error rate of a receiving signal is detected using an FEC function; and wherein an error rate of a receiving signal is detected using a byte B1 of an overhead if the receiving signal is a SONET/SDH signal.

In related art, Jones et al. disclose wherein an error rate of a receiving signal is detected using an FEC function; and wherein an error rate of a receiving signal is detected using a byte B1 of an overhead if the receiving signal is a SONET/SDH signal (read as, the bit error rate 46 is

determined at the receiver, for example by known techniques such as examination of SONET overhead bytes, or through forward error correction statistic (FEC)) (figure 5; paragraph 0047).

It would have been obvious for a person of ordinary skill in the art at the time of the invention to incorporate the teachings of Jones et al. with Ihara et al. as modified by Sobiski et al. Because Jones et al. disclosed a system and method for improving the accuracy of dispersion compensation.

21. **Claim 27** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Ihara et al. (US Patent # 5,999,289)** in view of **Sobiski et al. (US Patent # 6,498,886)** and in further view of **Wilson et al. (US Patent # 6,798,500).**

Consider **claim 27, and as applied to claim 23 above**, Ihara et al. as modified by Sobiski et al. disclosed the invention as described above; except for, wherein in said peak detection step, a D flip-flop inputting data, a decision threshold and a timing-adjusted clock, and storing and outputting a result of comparing data with a decision threshold is used.

In related art, Wilson et al. disclose, wherein in said peak detection step, a D flip-flop inputting data (read as, decision devices 206 and 208; figure 8), a decision threshold and a timing-adjusted clock, and storing and outputting a result of comparing data with a decision threshold is used (figure 8; column 4 lines 65-67; column 5 lines 1-8).

It would have been obvious for a person of ordinary skill in the art at the time of the invention to incorporate the teachings of Wilson et al. with Ihara et al. as modified by Sobiski et al. Because Wilson et al. disclose a system for high data rate accurate dispersion monitoring; by creating and analyzing the contour map of the eye diagram.

Allowable Subject Matter

22. **Claims 18 and 24** objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

23. The following is a statement of reasons for the indication of allowable subject matter: prior art disclose the invention as described above, except for, wherein said control unit sets a threshold of an amount of change in optimal chromatic dispersion compensation, and controls the chromatic dispersion compensation with high accuracy by a down-hill method or a dithering method, if an observed amount of change is equal to or less than the threshold and controls the chromatic dispersion at high speed using a positive/negative sign of residual chromatic dispersion obtained from a peak value and an absolute value of an amount of chromatic dispersion to be compensated if the amount of change exceeds the predetermined threshold; and wherein in said determining step, a threshold of an amount of change in optimal chromatic dispersion compensation is set, and chromatic dispersion compensation is controlled with high accuracy by a down-hill method or a dithering method, if an observed amount of change is equal to or less than the threshold, and chromatic dispersion is controlled at high speed using a positive/negative sign of residual chromatic dispersion obtained from a peak value and an absolute value of an amount of chromatic dispersion to be compensated, if the amount of change exceeds the predetermined threshold.

Conclusion

24. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a) Sato et al.; 6,229,631

b) Roberts, Kim Byron; 6,252,692

c) Robinson et al.; 2002/0122220

d) Kamalov et al.; 2004/0037569

e) Sugawara, Mitsuru; 6,718,138

f) Graves, Alan F.; 2004/0208606

g) Nishimoto et al.; 6,871,024

h) Bessios, Anthony; 6,862,413

i) Tateyama et al.; 7,123,846

j) Jones et al.; 2003/0039013

25. Any response to this Office Action should be **faxed to** (571) 273-8300 **or mailed to**:

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Hand-delivered responses should be brought to

Customer Service Window
Randolph Building
401 Dulany Street
Alexandria, VA 22314

Any inquiry concerning this communication or earlier communications from the

Examiner should be directed to Thi Le whose telephone number is (571) 270-1104. The Examiner can normally be reached on Monday-Friday from 7:30am to 5:00pm.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Kenneth Vanderpuye can be reached on (571) 272-3078. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free) or 703-305-3028.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist/customer service whose telephone number is (571) 272-2600.

Thi Le

KENNETH VANDERPUYE
SUPERVISORY PATENT EXAMINER